

**Claims:**

1. A top-pumped optical device comprising:  
a substrate;  
a lower cladding layer formed on the substrate;  
5 a gain medium structure formed on the lower cladding layer and excited by absorbing pumping light; and  
a light source disposed above the gain medium structure for pumping the gain medium structure by means of light directed downward therefrom,  
wherein a portion of the gain medium structure, which is included in a  
10 beam spot of the light source, has a larger area than other portions of the gain medium structure.
2. The top-pumped optical device as set forth in claim 1, further comprising an upper cladding layer formed on the gain medium structure,  
wherein the upper cladding layer is made of a material which transmits the  
15 light irradiated from the pumping light source.
3. The top-pumped optical device as set forth in claim 1,  
wherein the gain medium structure does not exhibit great absorption property in a signal wavelength band of the optical device, but exhibits great absorption property in other wavelength bands.
- 20 4. The top-pumped optical device as set forth in claim 3,  
wherein the gain medium is made of one selected from the group consisting of a macromolecular substance doped with excited elements, a silica-based substance doped with excited elements, a chalcogenide glass substance doped with excited elements, and a GaN or GaN-based substance doped with  
25 excited elements.
5. The top-pumped optical device as set forth in claim 4,  
wherein the gain medium is doped with nano-crystals as well as the excited elements.
6. The top-pumped optical device as set forth in claim 5,

wherein the excited elements are rare-earth elements.

7. The top-pumped optical device as set forth in claim 1,  
wherein the pumping light source is a LED.

5        8. The top-pumped optical device as set forth in claim 1,  
      wherein the gain medium structure includes adiabatic portions between  
the portion having the larger area and other portions.

10       9. The top-pumped optical device as set forth in claim 1,  
      wherein the pumping light source contacts a top surface of the upper  
cladding layer.